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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHANG, JUNGWON

ART UNIT PAPER NUMBER

2154

DATE MAILED: 12/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/828,869

Applicant(s)

WEINMAN, JOSEPH B.

Examiner

Jungwon Chang

Art Unit

2154

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed on 9/30/2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 September 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

FINAL ACTION

1. This Action is in response to amendment filed on 9/30/2005.
2. The replacement drawings filed on 9/06/2005 are accepted by the Examiner.
3. Claims 1-13 are presented for examination.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. **Claims 10-13** are rejected under 35 U.S.C. 102(e) as being anticipated by Dion et al. (US 6,163,856), hereinafter Dion.
6. As for claim 10, Dion discloses a method of data mirroring to insure the continuity of data, said method comprising the steps of:
 - (i) receiving a data write request at a primary mirror controller (col. 5, lines 13-15; step 2.1, Fig. 2);

(ii) sending, by the primary mirror controller, the data write request to each of at least two remote mirror sites (col. 5, lines 15-24; col. 16, line 65 – col. 17, line 9);

(iii) receiving an acknowledgement message (ACK) from each remote mirror site, wherein each ACK comprises information that the data write request has been received and executed by the remote mirror site for which the ACK corresponds (col. 15, lines 27-36); and

(iv) sending an ACK that the data write request has been completed (col. 15, lines 53-60).

7. As for claim 11, Dion discloses the method of claim 10, wherein each of said remote mirror sites is adapted to write the data write request to a cache (cache 152, Fig. 2) and to a remote storage means (disk 142, Fig. 2; col. 9, lines 1-22).

8. As for claim 12, Dion discloses the method of claim 10, further comprising the steps of:

(v) upon completion of step (i), writing the data write request to a cache connected to the primary mirror controller (col. 5, lines 42-47; cache 130, Fig. 2); and

(vi) upon the completion of step (iii), removing the data write request from the cache connected to the mirror controller (col. 15, lines 37-43).

9. As for claim 13, Dion discloses the method of claim 10, further comprising the steps of:

(v) detecting an interruption of service by the primary mirror controller (col. 5, lines 48-67);

(vi) switching to a secondary mirror controller (col. 5, lines 48-67);

(vii) performing steps (i)-(iv) substituting the secondary mirror controller in place of the primary mirror controller (col. 5, lines 48-67).

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. **Claims 1-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Dion in view of McKean et al. (US 6,67,387 B1) (hereinafter McKean).

12. As for claim 1, Dion discloses a data mirroring system, comprising:

a local site at a first location comprising:

a server (local server 122, Fig. 2); and

a primary mirror controller (local geographical data replication software; abstract; Telescope 160L, Fig. 2; col. 9, lines 23-55); and

at least two remote mirror sites (exemplary remote site 140, Fig. 2; more than one remote sites; col. 7, lines 1-8), each at different geographic locations, wherein each location is other than the first location (col. 6, line 55 – col. 7, line 8), and wherein each

remote mirror site comprises:

means for storing data (disk 142, Fig. 2);

wherein said local site is communicatively coupled to each remote mirror site
(col. 6, line 55 – col. 7, line 8; Fig. 2)

13. Dion teaches that a wide variety of memory devices may be used, including disk clusters (col. 8, lines 59-62). Dion does not specifically disclose using a disk array controller. McKean teaches the use of a disk array controller for the purpose of managing of a storage area network for storing large amounts of data (col. 1, lines 28-44). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Dion by using a disk array controller in order to manage a storage area network for storing large amounts of data, as taught by Dion above.

14. As for claim 2, Dion discloses the system of claim 1, wherein each of said at least two remote mirror sites further comprise a cache (cache 152, Fig. 2).

15. As for claim 3, Dion does not specifically disclose that the local site may further comprise a storage area network (SAN). McKean teaches the use of a SAN for storing large amounts of data (col. 1, lines 28-44). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Dion by using a SAN at the local site in order to increase the amount of data storage, as taught by Dion above.

16. As for claim 4, Dion discloses the system of claim 1, the local site further comprising:

a cache (cache 130, Fig. 2); and
means for storing data (disk 126, Fig. 2).

17. As for claim 5, Dion discloses the system of claim 1, wherein at least one of said at least two remote sites is geographically displaced at least twenty-five miles from the local site (col. 3, lines 5-8; col. 6, lines 55-60).

18. As for claim 6, Dion discloses the system of claim 1, wherein said at least two remote sites further comprising exactly two remote sites (col. 6, line 55 – col. 7, line 8).

19. As for claim 7, Dion discloses the system of claim 6, wherein said remote sites are substantially diametrically opposed to each other, and said remote sites are geographically located at least approximately 25 miles apart (col. 3, lines 5-8; col. 6, line 55 – col. 7, line 8).

20. As for claim 8, Dion discloses the system of claim 1, further comprised of:
a backup site (remote site, Fig. 2) comprising a backup mirror controller (telescope 160R, Fig. 2) and a backup server (remote server 140, Fig. 2), and adapted to being operational when the local site ceases normal functions (Fig. 2; a spare is ready to take over if the primary should fail; col. 1, lines 12-15; data is mirrored to a

remote site, which can take over system functions if the local site is lost; col. 1, lines 49-50; col. 7, lines 1-8).

21. As for claim 9, Dion discloses the system of claim 8, said backup site further comprising:

- a cache (cache 152, Fig. 2); and
- a means for data storage (disk 142, Fig. 2).

Conclusion

22. Applicant's arguments filed on 9/30/2005 have been fully considered but they are not persuasive.

23. In the remarks, the applicant argued in substance that:

I. Rejections under 35 U.S.C. 102

(1) Applicant's argues on page 8 of the remarks that claim 10 has the limitations of:

receiving a data write request **at a primary mirror controller**; sending, by the primary mirror controller, the data write request to each of at least **two remote mirror sites...**"

Dion does not show these limitation because Dion does not include a primary mirror controller communicating with two (or more) remote mirror sites.

In reply to argument (1), examiner finds that Dion clearly discloses primary mirror controller (local geographical replication software; abstract; 160L, fig. 2) communicating with two (or more) remote mirror sites (2.2, fig. 2; col. 6, line 55 – col. 7, line 8; col. 9,

lines 23-55).

(2) Applicant argues that "The Office Action states that Dion discloses receiving a data write request at a primary mirror controller because Dion discloses that the "geographical replication software running on the local site intercepts all file system requests issued by local clients." (Col. 5, lines 13-15). Therefore, the Office Action equates Dion's geographical replication software to Applicant's primary mirror controller. They are, however, very different because Applicant's primary mirror controller is not associated with a specific file storage system and only executes on the primary server. The primary mirror controller communicates with two or more remote mirror sites. Dion's geographical replication software, however, executes on the remote site upon a failover."

In reply to argument (2), Dion explicitly discloses local geographical replication software (160L, fig. 2) running on a local server (abstract, lines 5-15), and compatible remote geographical replication software (160R, fig. 2) running on a remote site (abstract, lines 5-15). Therefore, Dion's local geographical replication software (160L, fig. 2) only executing on the local server has the same functionality as the primary mirror controller claimed in claims 1 and 10. Furthermore, applicant's argument with respect to "Applicant's primary mirror controller is not associated with a specific file storage system", is not persuasive. On page 10, paragraph 29 of the present specification, also shown in Fig. 3:

Upon receiving a write I/O from the server(s) 301, in accordance with the invention, the bipolar mirror controller 303 may write the I/O to its cache 307

before sending requests to each of the remote storage subsystems 311, 321.

It is clear that the primary mirror controller is associated with a specific file storage system.

(3) As disclosed above, Dion's geographical replication software is not a primary mirror controller and, therefore, Dion does not disclose a primary mirror controller sending a data write request to remote mirror sites."

In reply to argument (3), for the same reasons cited in reply (2) above, Dion's local geographical replication software, 160L, fig. 2, is the primary mirror controller and, therefore, Dion discloses a primary mirror controller sending a data write request to remote mirror sites.

(4) Dependent claims 11-13 are allowable for the reasons stated above and because they depend from an independent claim.

In reply to argument (4), claims 11-13 are properly rejected under 35 U.S.C. 102(e) for the same reasons cited above with respect to independent claim 10 above.

For all of the theses reasons, claims 10-13 are properly rejected under 35 U.S.C. 102(e) as being anticipated by Dion.

II. Rejections under 35 U.S.C. 103

(5) McKean fails to cure the deficiencies of Dion. McKean is directed to a controller managing computer access to a number of storage volumes in a storage peripheral.

Art Unit: 2154

McKean does not, however, deal with data mirroring and, as a result, does not disclose a primary mirror controller. Thus, amended independent claim 1 is allowable over Dion in view of McKean.

In reply to argument (5), in response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). As noted in paragraphs 12 and 13 above, Dion discloses a primary mirror controller (local geographical replication software; abstract; 160L, fig. 2; col. 9, lines 23-55), and disk clusters (col. 8, line 59 – col. 9, line 22). What Dion fails to specifically disclose is a disk array controller. McKean is only relied upon by the Examiner to teach the disk array controller (col. 1, lines 28-44).

(6) Dion does not disclose a backup site having a backup mirror controller and backup server and adapted to being operational when the local site ceases normal functions. As described above, Dion does not disclose a primary mirror controller. Therefore, Dion does not disclose a mirror controller that backs up the primary mirror controller. The Office action states that Dion discloses this limitation with the remote site in Fig. 2 of Dion. The remote server in Fig. 2 of Dion, however, is not a backup **mirror controller**. Instead, the remote server is the site at which the data is mirrored and is not, therefore, a primary mirror controller for communicating with remote mirror sites.

In reply to argument (6), applicant's argument with respect to the remote server

in Fig. 2 of Dion, however, is not a backup **mirror controller**. This is a misinterpretation of the examiner's Office action. The examiner agrees that the remote server is not a backup mirror controller, however, this is not what the examiner relied on in the rejection. As stated in paragraph 20 above, Dion clearly discloses a backup site (remote site, Fig. 2) comprising a backup mirror controller (remote geographical replication software; telescope 160R, Fig. 2) and a backup server (remote server 140, Fig. 2) and adapted to being operational when the local site ceases normal functions (a spare is ready to take over if the primary should fail; col. 1, lines 12-15; data is mirrored to a remote site, which can take over system functions if the local site is lost; col. 1, lines 49-50; col. 7, lines 1-8).

For all of the theses reasons, claims 1-9 are properly rejected under 35 U.S.C. 103(a) as being unpatentable over Dion in view of McKean.

24. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

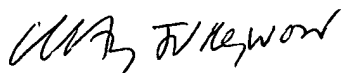
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Art Unit: 2154

25. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jungwon Chang whose telephone number is 571-272-3960. The examiner can normally be reached on 9:30-6:00 (Monday-Friday).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John A Follansbee can be reached on 571-272-3964. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jungwon Chang
December 16, 2005